KB-211/KB-211GM

TWO-CHANNEL SPEAKER STATIONS

USER MANUAL

Clear-Com®
Intercom Systems

Introduction

Congratulations and thank you for choosing this Clear-Com product.

The KB-211 and KB-211GM Two-Channel Speaker Stations are powerful, user-friendly units that can serve as versatile intercom stations.

Please read this manual completely to better understand the functions of these products. For questions not addressed in this manual, contact the dealer or Clear-Com directly. Clear-Com applications support and service people are ready to help.

Description

The Clear-Com PL-Pro™ KB-211 is a two-channel speaker station designed for use in theatres, live performances, industrial environments, and small television facilities. It features speech intelligibility, even in high noise levels, and can be customized through its programmable options.

In addition, the Clear-Com PL-Pro™ KB-211GM also contains a jack for an optional Clear-Com gooseneck panel microphone and a close-in, voice-operated circuit (VOX). This circuit allows automatic, alternate dipping of the panel microphone and the speaker in response to conversation.

Selectable, two-channel talking and/or listening allows the operator to communicate on either of the intercom channels. The dual-action talk button operates in electronic momentary or latching mode. Monitoring can be done through the headset, the integral speaker, or both simultaneously. The KB-211 offers both visual and audible call signaling to attract the attention of operators. The Remote Mic Kill (RMK) feature on main stations will turn off any open microphones on the KB-211.

A balanced program input allows the monitoring of external audio using the headset or speaker. This program input can also be used as a paging function.

The KB-211 speaker station accepts dynamic headsets, such as the Clear-Com PL-Pro™ Series HS-6 Telephone Handset or PT-4 Push-to-Talk Hand Microphone. A sidetone control allows the operator to vary the level of his voice heard through the headset and speaker.

The integral speaker can be turned on or off by a convenient front-panel switch. An automatic speaker dipping circuit will lower the level of the speaker whenever the talk button is activated. The KB-211GM's close-in VOX dips the speaker or gooseneck microphone automatically as the station is used. These features help minimize acoustical feedback.

The KB-211 receives 30-VDC power from the Clear-Com intercom line. The unit mounts either in a standard four-gang electrical outlet box or in an optional Clear-Com V-Box. The extra-thick front panel and compact, surface-mount circuitry results in a reduced size and lighter weight package that maintains Clear-Com ruggedness. The two intercom channels connect to a

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plug-on screw terminal strip. Male and female three-pin XLR connectors are provided on the V-Box for an in-line connection to one of the intercom channels.

The optional EB-TW daughter board module can be installed to provide an interface to two intercom channels on a single microphone cable. Also, the EB-4W 4-Wire daughter board module is available to allow long-distance connections using separate pairs of wires for send audio and receive audio. The EB-4W 4-Wire option supports two-channel operation.

The KB-211 and KB-211GM are compatible with all Clear-Com Party-Line intercoms.

Quick Start

1. Unpack the unit and inspect it for any damage that may have occurred during shipping.
2. Set the Option switches to the default (up) position.
3. Connect the intercom lines. If only one intercom line is to be connected, set Option Switch 1 to the ON or CLOSED position.
4. Install the KB-211 into the four-gang outlet box or V-Box. (For additional information, refer to the Clear-Com PL-Pro™ System Installation Manual.)
5. Set Listen Levels and Sidetones. (Refer to“5—Sidetone Control” on page 4.)
6. The speaker station should now be operating properly.
7. Read the rest of this manual for further information.

Operation

Normal operation of the KB-211 Speaker Station only requires the front-panel controls. The controls located elsewhere on the unit are intended to be set-and-forget in nature. For intercom operation, set the Listen level control to the desired level and press the Talk button when talking. If a headset or handset is used, set the Sidetone control for each channel for the desired amount of sidetone in the earphone. If the PT-4 hand-held, push-to-talk microphone is used, or if the panel microphone is used on the KB-211GM, set the sidetone controls for minimum feed-through to the speaker to prevent acoustic feedback.

Front Panel

The controls, indicators, and connectors on the KB-211 and KB-211GM front panels are shown on Figure 1 on page 3 and are described by the following text.

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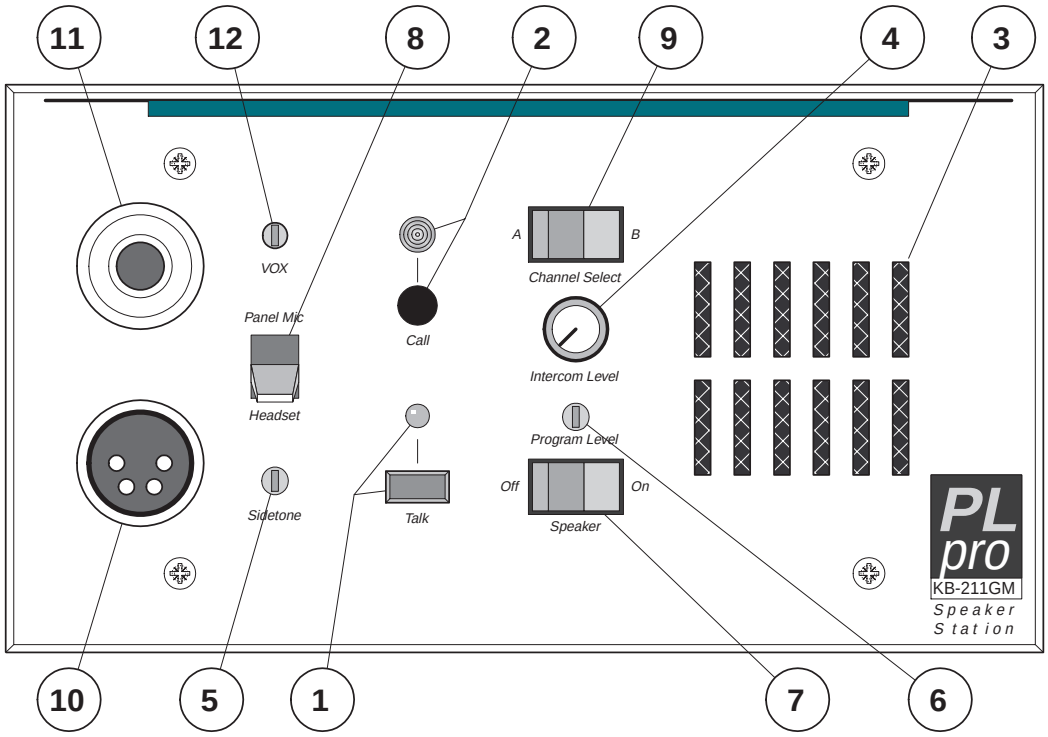

FIGURE 1: Front Panel

1—Talk Button and Lamp

The Talk button activates the microphone feed to the selected intercom channel. The Talk button has a dual action (momentary or latching) depending upon how the button is pressed. If desired, the latching function can be defeated using an internal switch. The following describes the various functions of this button.

- Momentary—Press and hold the Talk button while speaking. Release it when finished.
- Latching—Press and release the button quickly to latch the Talk function. Press and release the button again to turn off the Talk function.
- Talk Indication—The associated Talk lamp will illuminate green when the Talk function is activated.
- VOX indication—On the KB-211GM, when the VOX feature is enabled, the Talk lamp will illuminate green when the Talk function is activated, but will turn red when the panel microphone is in use. This automatically dips the speaker volume.

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- Speaker Dip—If the front-panel speaker is turned on and the VOX feature is not used, pressing the Talk button will reduce the speaker output level to avoid feedback.

2—Call Button and Lamp

Pressing the Call button will send a call signal on the selected channel. All the call lights on that channel will then flash. Call signals can also be sent while talking if required. The Call lamp will light while the Call button is pressed, or whenever a call signal is present on the selected channel. An internal option jumper can be set to allow the Call lamp to light when a call signal is present on either channel.

3—Tone Alert

An audible tone alert can sound when a call signal is received on the selected channel or either channel. This can be useful when the operator's attention has been drawn away from the KB-211 indicator panel. The audible tone alert level can be adjusted or turned off by an internal control. The Tone Alert will not sound if a call signal is originated at the KB-211 station or if the Speaker ON/OFF Switch is turned off. The Tone Alert plays through both the speaker and headset if the Speaker ON/OFF Switch is turned on.

4—Intercom Level Control

Turn this control to set the listen level required on the speaker or headset. This control does not affect the Tone Alert level or the Program Input level.

5—Sidetone Control

Sidetone is the level of the operator's voice that is heard while talking on the intercom. Setting a comfortable level of sidetone will ensure that the intercom line sounds alive and also helps modulate the operator's voice relative to other voices on the line.

Typically, different Sidetone settings are needed depending upon whether the speaker is used. Use one of the following procedures to correctly set the Sidetone level control.

Sidetone Adjustment Procedure for Headset

Follow these steps to adjust a headset's sidetone level.

1. Set the Intercom Level control to a comfortable level by having someone talk to the operator from another station.
2. Press the Talk button and speak into the microphone while turning the Sidetone control slowly back and forth until the voice reaches a comfortable level in the headset.

Follow these steps to adjust the sidetone for gooseneck microphones on the KB-211GM or PT-4 hand-held, push-to-talk microphone with the Speaker turned on.

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1. Set the VOX control fully counterclockwise to disable this feature. (KB-211GM only)
2. Set the Intercom Level control to a comfortable level.
3. Press the Talk button and speak into the microphone while turning the Sidetone control slowly back and forth. There should be a point where the operator's voice (and any accompanying acoustic feedback) disappears. This is the null point.
4. Readjust the VOX control. (Refer to "12—VOX Control (KB-211GM only)" on page 6.)

6—Program Level Control

Adjust the Program Level control to set the program audio level heard in the headset or panel speaker.

Note: Forcing the trimpots past their stop points will damage them.

7—Speaker ON/OFF Switch

The Speaker ON/OFF Switch turns the front-panel speaker on or off. This switch also controls whether the Tone Alert is heard through the speaker. The speaker volume will automatically dip when the talk function is set, unless the VOX function is enabled.

8—Mic Select Switch (KB-211GM only)

The Mic Select switch selects whether the panel microphone or the headset microphone is active. When the VOX feature is enabled, it is only operational when the panel microphone is active.

9—Channel Switch

This switch selects the intercom channel (A or B) on which the speaker station is active.

10—Headset Connector

The headset connector is located on the front panel. All Clear-Com headsets are recommended for use with the KB-211. The Clear-Com PT-4 Push-to-Talk Microphone or the HS-6 Telephone Handset will also plug into the headset connector. The following is a description of the characteristics of a suitable headset:

- Mic Type—Dynamic; 150 to 400 ohms impedance; -55 dB output level
- Headphone—Dynamic; 50 to 2000 ohms impedance.

The wiring of the headset is to be as follows:

- Pin 1—microphone ground (shield)
- Pin 2—microphone hot
- Pin 3—headphone ground

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- Pin 4—headphone hot.

The microphone and headphone wiring in the headset cord must be individually shielded.

Note: Do not connect Pins 1 and 3 together. Headset extension cords or headset ”Y” cables are not recommended because they may increase crosstalk between channels.

11—Panel Mic Connector (KB-211GM only)

Clear-Com recommends the GM-9 (9 in. long) and GM-18 (18 in. long) plug-in panel microphones be used with the KB-211GM. Both are the electret type. The 1/4-in. phone jack on the microphone mates with the Panel Mic receptacle on the KB-211GM’s front panel.

To install a GM-9 or GM-18 microphone:

1. Remove the plastic plug from the jack, if present.
2. If a set screw is present in the microphone-mounting flange, check and unscrew it to make sure it is clear of the threads in the bushing.
3. Screw the microphone into the bushing and tighten.
4. Optional: Replace the set screw supplied with the gooseneck microphone on top of the microphone-mounting flange and turn it clockwise to lock the microphone in place.

12—VOX Control (KB-211GM only)

When the panel microphone is selected on the KB-211GM, the VOX control should be adjusted for proper operation. This control is located to the right of the panel microphone connector and is recessed slightly into the front panel. Use a narrow, flat-blade screwdriver such as a "greenie" or "tweaker" for this adjustment. When the adjustment is correctly set, the Talk lamp will be red when speaking into the panel microphone and will be green when hearing audio from the speaker. Turning the control clockwise makes the KB-211GM more sensitive. The VOX feature can be disabled by turning the VOX control fully counterclockwise.

Internal Adjustments and Connections

The controls and connectors inside the KB-211 are shown in the following figure and described by the following text. The controls can be accessed without completely removing the panel from its wall box or V-Box enclosure by removing the top two screws and loosening the bottom two screws a few turns. The panel can then be leaned out from the wall to make the controls accessible as shown in the lower view of Figure 2 on page 7.

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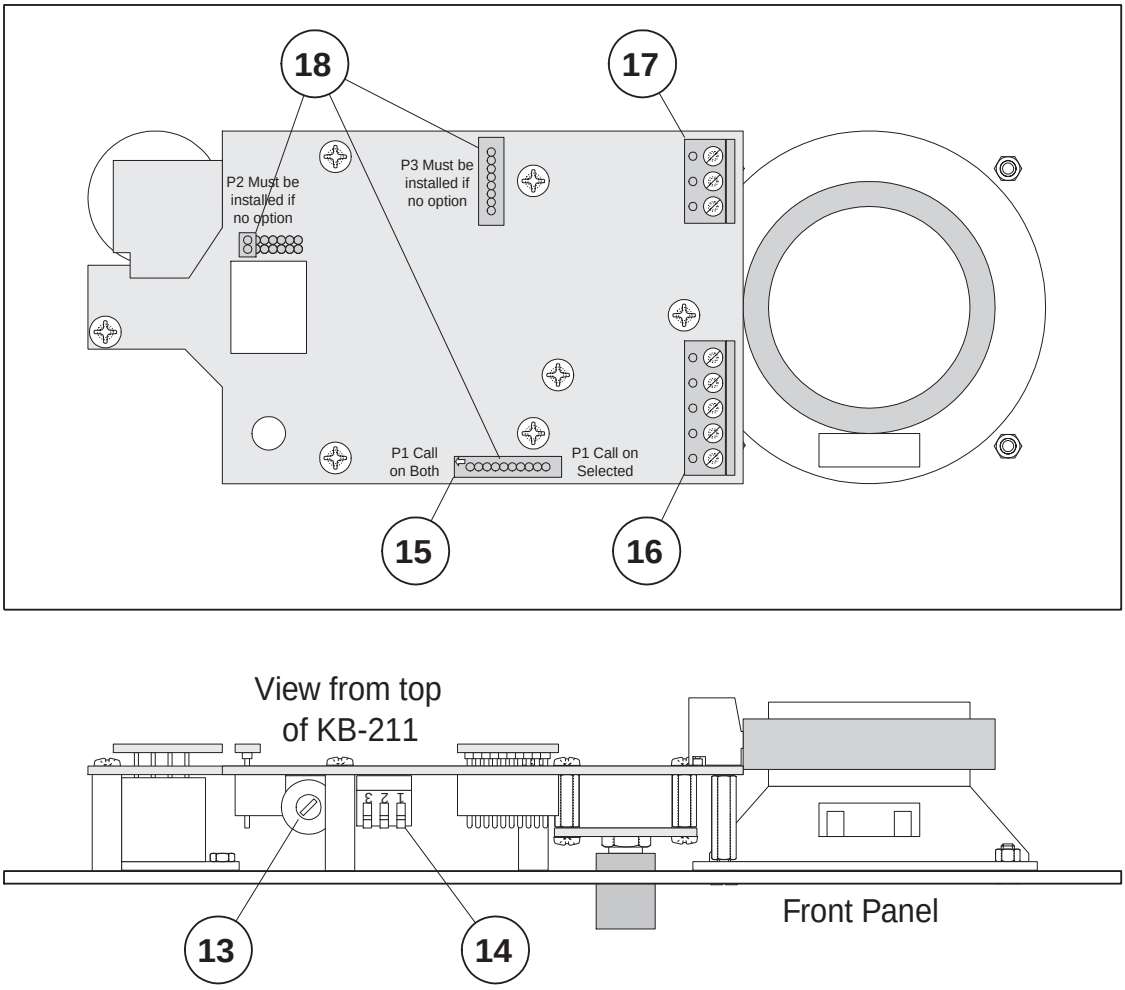

FIGURE 2: Internal Adjustments and Connections

13—Call Alert Tone Level Control

This control adjusts the volume of the Call Alert Tone sound. This is normally adjusted when the system is set up and shouldn't need to be adjusted during normal operation. This feature can be disabled by turning the control fully counterclockwise.

14—Option Switches

Three Option switches are provided. They should be configured when the system is set up and shouldn't be changed in normal operation.

Note: The ON position of each switch is toward the circuit board and the OFF position is toward the front panel. The default position of the switches is in the OFF position. The function of each switch is as follows:

1—Single Channel

In some installations, the KB-211 is intended to be used only with one intercom channel. Setting the Single Channel switch to the ON position will connect the KB-211 to the one intercom channel regardless of the position of the front-panel Channel selector.

Note: In two-channel installations, this switch must be set to the OFF position.

2—Long Line

If a long cable run is unavoidable and approaches 700 ft. or more, set the Long Line option switch to the ON position. The ability to set an effective sidetone depends upon properly setting this switch.

3—Latch Diable

Setting the Latch Disable switch to the ON position will disable the latching function of the Talk button. In this mode, the Talk button must be held in continuously while the operator is talking.

15—Call Signal Jumper

In some installations it is important to receive a call signal from either channel, regardless of the setting of the Channel selector. The plug-on jumper P1 makes the Call lamp respond to either the selected channel or to both channels, depending upon its orientation. By default, the jumper is set to the selected channel position. When the TW or 4-Wire Option modules are installed, this jumper is not used. In TW operation, the call signal always originates on channel A. In 4-Wire operation, the call signal is not used.

16—Intercom Line Connection

The KB-211 contains a five-terminal, plug-on connector for intercom line connection. This connector is intended to be unplugged from the circuit board when connecting the intercom line, and then plugged back on when the wiring is completed. The connections for each pin are visible on the circuit board when the connector is unplugged. The pinout of this connector is as follows:

- Pin 1—(NC)
- Pin 2—Channel A Audio
- Pin 3—Channel B Audio
- Pin 4—Power (+30 VDC)
- Pin 5—Ground (Shield).

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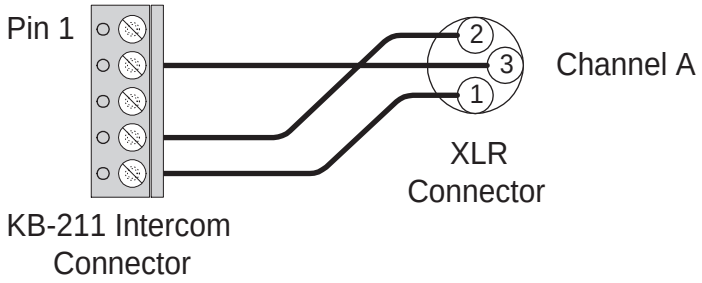

FIGURE 3: One-Channel Cable Wiring

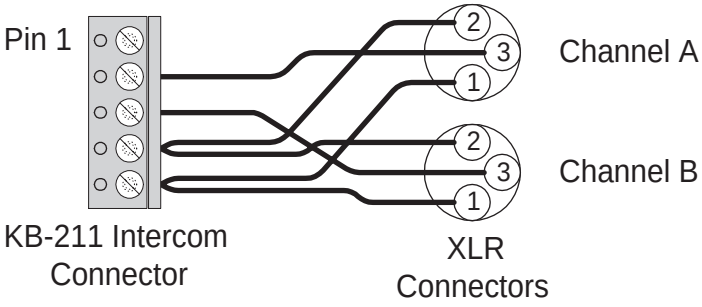

FIGURE 4: Two-Channel Cable Wiring

17—Program Input

A three-terminal, plug-on connector provides the program input to the station. Program is fed to the headset and speaker. The level to the speaker or headset is controlled by the Program Level control. The Program Input accepts a balanced or unbalanced line-level audio signal from -20 dBv to +10 dBv. If this input is connected to the stage announce (SA) output of a Main Station it can be used as a paging input. Since the level of this input is independently adjustable from the intercom audio volume, it can be used to override the intercom audio. The pinout of this connector is as follows:

- Pin 1— Ground (Shield)
- Pin 2— + Signal
- Pin 3— - Signal.

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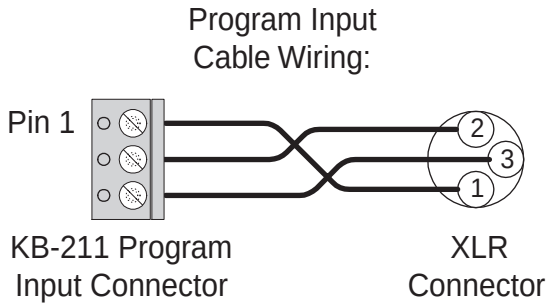

FIGURE 5: Program-Input Cable Wiring

18—Option Board Jumpers

The three jumper plugs P1, P2, and P3 must be installed when optional modules are not used. When the optional EB-4W or EB-TW modules are used, both P1 and P3 must be removed. In the KB-211GM, P2 is replaced by the VOX module. Save these jumper plugs for possible future use.

Note: The KB-211 will not operate without either these jumper plugs or the optional modules installed.

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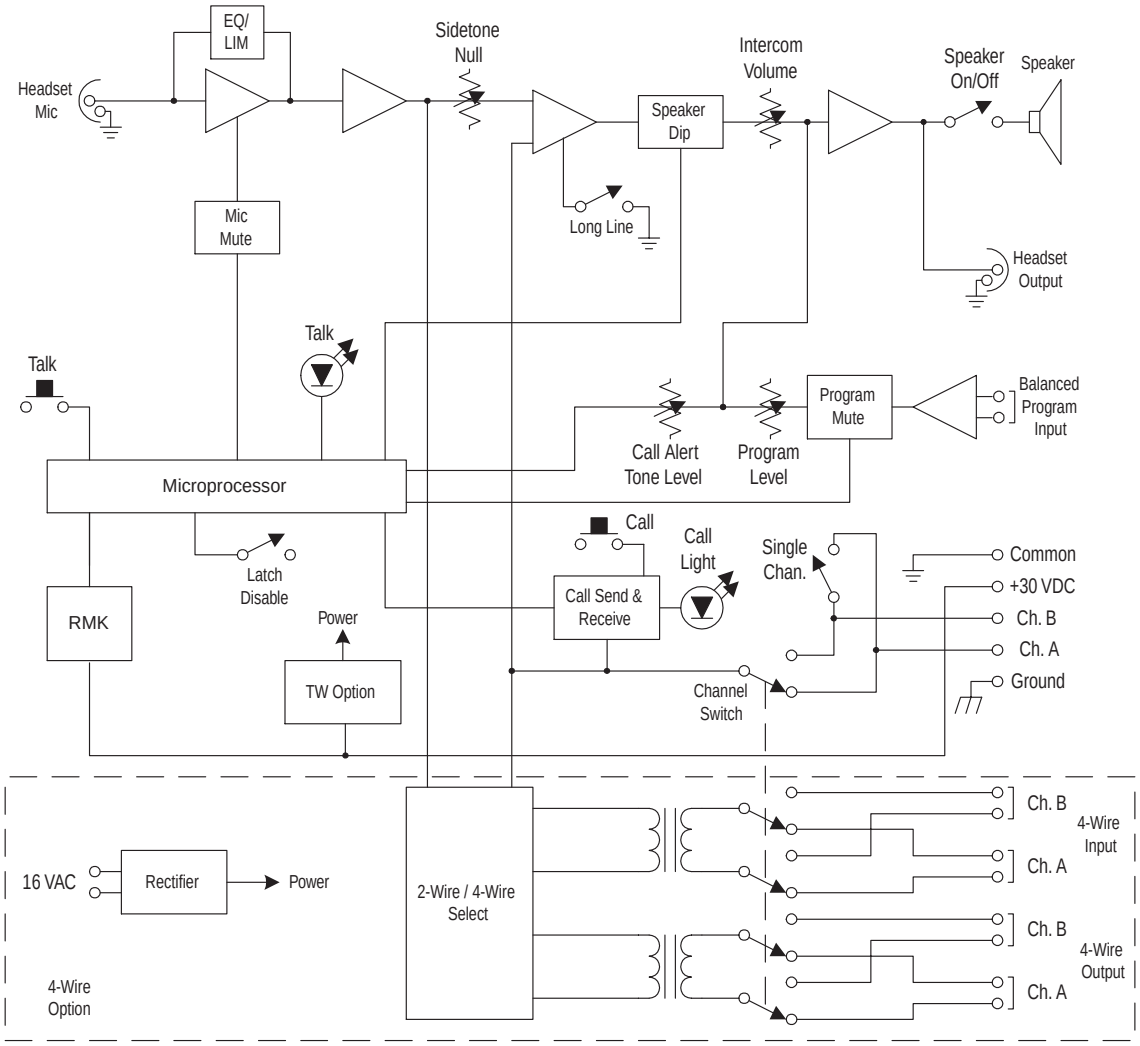

FIGURE 6: KB-211 Block Diagram

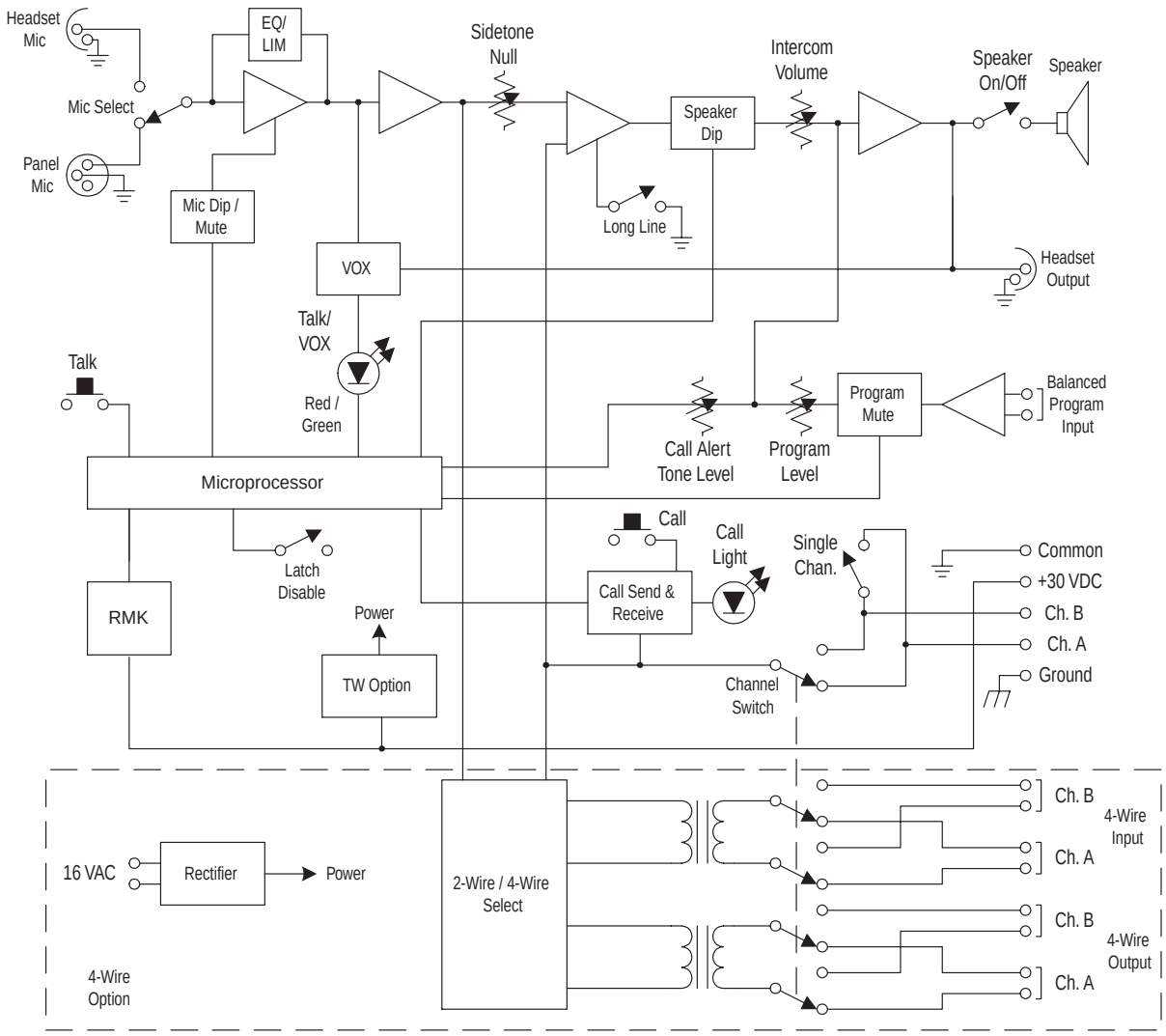

FIGURE 7: KB-211GM Block Diagram

Troubleshooting

- **System does not operate. Talk Light does not come on when Talk button is pressed**.

Scenario 1

The KB-211 doesn't have an intercom connection. If the EB-4W 4-Wire Option Module is connected, the KB-211 may not be receiving AC power.

Solution: Check connections and cable.

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Scenario 2

The KB-211 has an internal failure.

Solution: Unit requires servicing.

- **Speaker does not operate, but the Talk Light comes on when Talk button is pressed**.

Scenario 1

The Speaker switch is turned off, the volume knob is turned all the way down, or the channel switch is set to the unused channel.

Solution: Adjust controls appropriately.

Scenario 2

The speaker plug or wiring has come loose.

Solution 2: Make sure speaker is connected internally.

Scenario 3

Plug P3 is missing on circuit board.

Solution: Plug P3 must be installed in J3 jack if the EB-TW or EB-4W options are not used.

- **Hum or buzz in the system.**

Scenario 1

Inductive pickup caused by close proximity of this speaker station or connected stations to power lines or transformers.

Solution: Relocate the offending unit or wiring. If the cable run is exceptionally long, consider adding and using the EB-4W 4-Wire Option Module. (Requires an additional 4-wire interface at the opposite end of the “long run.”)

- **System feedback (Acoustical).**

Scenario 1

Intercom Level control at this station or another station is set too high.

Solution: Adjust.

Scenario 2

The Sidetone control at this station or another station is not correctly adjusted.

Solution: Adjust. Refer to “5—Sidetone Control” on page 4.

Scenario 3

Channel not terminated.

Solution: Set the Main Station or Power Supply termination switch for that channel to the ON position.

Scenario 4

The Channel switch set to an unconnected channel.

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Solution: If only one intercom line is connected, set Option Switch 1 to the ON or CLOSED position to link both channel switch positions to the same intercom line.

Scenario 5

A headset extension cord was used.

Solution: Headset extension cords are not recommended.

- **VOX problems (KB-211GM only)**

Scenario 1

VOX stays tripped (red light on) or the sensitivity is set too high.

Solution: Turn VOX sensitivity control in a counter-clockwise direction.

Scenario 2

VOX will not trip with voice (green light on) or the sensitivity is set too low.

Solution: Turn VOX sensitivity control in a clockwise direction.

Note: VOX is intended for close-in operation.

- **Excessive crosstalk**

Scenario 1

High DC resistance has a ground return.

Solution: Use heavier cable to add additional conductor(s) to the ground return. If the cable run is exceptionally long, consider adding and using the EB-4W 4-Wire Option Module.

Scenario 2

The multi-channel cable pairs are not individually shielded.

Solution: Replace the cable with individually shielded pairs.

Scenario 3

Headset cables are not wired or shielded properly.

Solution: Correct the wiring and use headsets with properly shielded wiring (see “10—Headset Connector” on page 5).

- **Program signal sounds distorted.**

Scenario 1

The Program Level control is set too high.

Solution: Turn the Program Level control counter-clockwise.

Scenario 2

Overload of Program Input circuit.

Solution: Reduce the gain of the program signal at the source, such as an audio mixer.

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- **The call signal does not function.**

Scenario 1

Excessive DC loading of intercom line.

Solution: Remove any audio transformers or other equipment that may be connected across the intercom line. If equipment other than Clear-Com intercom equipment must be connected to the intercom line, please contact Clear-Com application or service personnel for information or recommendations.

Scenario 2

Far too many terminations on the intercom line.

Solution: Check all main stations and power supplies to make sure each intercom channel is terminated at only one point.

Scenario 3

Plug P1 is missing on circuit board.

Solution: Plug P1 must be installed in the J1 jack if the EB-4W or EB-TW options are not used.

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Parts Lists

Parts List for the KB-211 / KB-211GM Main PCB and Chassis

Capacitors

Value		Type	Voltage	Tol.	Part #	Designator
220	uF	Aluminum	35V		150021	C8 C47
.01	uF	Ceramic Disc	1.4KV	20%	150029	C1
22	uF	Tantalum	16V		150032	C28
4.7	uF	Tantalum	35V		150044	C6
4.7	uF	Aluminum NP	50V		150087	C11
.047	uF	Mylar	100V	5%	150131	C24
100	uF	Aluminum	35V		150136	C17 C41
22	pF	Ceramic Disc SMD	50V	5%	151116	C14
47	pF	Ceramic Disc SMD	50V	5%	151120	C5 C19 C27 C30
220	pF	Ceramic Disc SMD	50V	5%	151128	C26
470	pF	Ceramic Disc SMD	50V	5%	151132	C7 C46
.0022	uF	Ceramic Disc SMD	50V	10%	151152	C16
.0047	uF	Ceramic Disc SMD	50V	10%	151156	C9 C20 C22
.01	uF	Ceramic Disc SMD	50V	10%	151160	C13 C37 C38 C40C31 C29
.047	uF	Ceramic Disc SMD	50V	10%	151168	C18 C35
.1	uF	Ceramic Disc SMD	50V	10%	151172	C10 C25 C32 C33 C34 C36 C45
.22	uF	Ceramic Disc SMD	50V	10%	151176	C15 C21 C23
.47	uF	Tantalum SMD	35V	10%	151184	C44 C39
1	uF	Tantalum SMD	16V	10%	151185	C2 C4 C12 C43
10	uF	Tantalum SMD	25V	10%	151192	C42

Resistors

Value		Power	Type	Tol.	Part #	Designator
10	OHM	1/4	Carbon Film	5%	410002	R15 R53
390	OHM	1/4	Carbon Film	5%	410005	R46
1.3K	OHM	1/2	Carbon Film	5%	410075	R44
2.2	OHM	1/10	SMD	5%	411181	R27
39.2	OHM	1/10	SMD	1%	411254	R25
100	OHM	1/10	SMD	1%	411293	R45 R35
221	OHM	1/10	SMD	1%	411326	R13
301	OHM	1/10	SMD	1%	411339	R47 R51
432	OHM	1/10	SMD	1%	411354	R20
825	OHM	1/10	SMD	1%	411381	R22
1.00K	OHM	1/10	SMD	1%	411389	R14 R33
1.50K	OHM	1/10	SMD	1%	411406	R43
2.00K	OHM	1/10	SMD	1%	411418	R18 R21 R42
2.74K	OHM	1/10	SMD	1%	411431	R48
6.19K	OHM	1/10	SMD	1%	411465	R28
6.81K	OHM	1/10	SMD	1%	411469	R17

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8.25K	OHM	1/10	SMD	1%	411477	R52
12.1K	OHM	1/10	SMD	1%	411493	R19 R38
15.0K	OHM	1/10	SMD	1%	411502	R16
20.0K	OHM	1/10	SMD	1%	411514	R24 R30 R31 R34 R39
56.2K	OHM	1/10	SMD	1%	411557	R37 R41
100K	OHM	1/10	SMD	1%	411581	R6 R12 R49 R50
121K	OHM	1/10	SMD	1%	411589	R32
475K	OHM	1/10	SMD	1%	411646	R26
1.0M	OHM	1/10	SMD	5%	411677	R54
10K	OHM		X4 SMD DIP Isolated	1%	416016	R8 R9 R10 R11
47K	OHM		X4 SMD DIP Isolated	1%	416018	R2 R3
100K	OHM		X4 SMD DIP Isolated	1%	416019	R1
220K	OHM		X4 SMD DIP Isolated	1%	416020	R7
470K	OHM		X4 SMD DIP Isolated	1%	416021	R4
Pot	10K		TRIMPOT		470058	R36
Pot	5K		TRIMPOT		470063	R40 R23
Pot	5K		POT		470081	R29

Diodes and Transistors

Device	Description	Part #	Designator
LED	BI-COLOR RED/GREEN 3 LEAD	390032	D8
LED	LED, YELLOW, ULTRA BRIGHT T1 3/4	390057	D14
IC	LM384 POWER 4W OP AMP 14 PIN	480012	IC5
IC	7805L POS 5V REGULATOR TO-92 PKG	480088	IC11
Diode	BAV70 DUAL DIODE COM CATHODE SMD	481019	D9 D12 D15 D16
IC	833 DUAL OPAMP... SMD	481023	IC1 IC2 IC8
Transistor	2907A PNP 60V 600MA... SMD	481027	Q2
Diode	BAV99 DUAL DIODE... SMD	481033	D1 D2 D3 D4 D5 D6 D11 D13
Transistor	MPSA14 DNPN 30V 300MA... SMD	481038	Q5
IC	DG444 QUAD CMOS ANALOG SW SMD	481050	IC9
Transistor	J175 P-CHANNEL JFET... SMD	481056	Q1 Q3
Diode	5.1V 5% ZENER 1/4W... SMD	481061	D7 D10
Transistor	MPSA64 DPNP 30V 500MA SMD	481075	Q4
IC	MICROPROCESSOR, KB/MR SERIES	710508	IC10

Miscellaneous

Device	Description	Part #	Designator
Connector	5 POS, SCREW TERM. PLUG-IN 5MM	210085	P4
XLR	4 PIN M FLUSH MOUNT W/SOLDER CUPS	210286	
Connector	3 POS, SCREW TERM. PLUG-IN 5MM	210370	P10
Pot	SHAFT FOR PIHER POT, GREY	240043	R36
Pot	PIHER TRIMPOT SHAFT, GREY	240057	R23 R40
Pot	KNOB GREY INSERT .45 DIA POINT TO RD	240077	R29
Button	ROUND MINIATURE BUTTON, BLACK	240081	S5
Button	RECT. MINIATURE BUTTON, BLACK	240082	S4
Lens	LENS, YELLOW, ROUND FOR T1 3/4	240099	D14
Speaker	2 1/2 IN. SPKR 16 OHM 3.5W	500139	

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Switch	DPDT P.B. MINIATURE W/LONG PLUNGER	510107	S4 S5
Switch	DPDT ROCKER PC MOUNT W/BRACKET	510111	S2
Switch	DIP SWITCH PIANO 3 POS	510114	S3
Switch	SPDT ROCKER, PC MNT W/BRACKET	510125	S1
Wire	4 CONNDUCTOR FLAT CABLE	770017	W1

Parts List for the KB-211GM VOX PCB

Capacitors

Value		Type	Voltage	Tol.	Part #	Designator
1	uF	Aluminum NP	50V	10%	150002	C13
470	pF	Ceramic Disc	50V	10%	150014	C10
4.7	uF	Tantalum	16V		150030	C8 C12
.1	uF	Monolithic	50V	10%	150035	C1 C2 C3
680	pF	Ceramic Disc	50V	10%	150061	C5
.022	uF	Monolithic	50V	10%	150082	C4
.01	uF	Monolithic	50V	20%	150109	C6 C9
220	uF	Aluminum	16V	20%	150146	C11
22	uF	Tantalum	10V	10%	150158	C14

Resistors

Value		Power	Type	Tol.	Part #	Designator
4.7K	OHM	1/4	Carbon Film	5%	410013	R1 R12 R16 R17 R13
6.8K	OHM	1/4	Carbon Film	5%	410036	R2
1.5K	OHM	1/4	Carbon Film	5%	410055	R6
1M	OHM	1/4	Carbon Film	5%	410058	R4 R8
100K	OHM	1/4	Metal Film	1%	410148	R11 R15
20K	OHM	1/4	Carbon Film	5%	410151	R14
10K	OHM		X5 SIP ISOLATED		415003	R3 R10
100K	OHM		X4 SIP ISOLATED		415014	R9
Pot	50K		TRIMPOT		470038	R5

Diodes and Transistors

Device	Description	Part #	Designator
Diode	1N4148 SIGNAL 10MA 75PIV	480000	D3 D4 D5 D6 D7 D8
Transistor	PN2222A NPN 30V	480006	Q1 Q2
IC	LF353 BIFET OP AMP	480010	IC1 IC2
Diode	1N5231B ZENER 5.1V .5W 5%	480038	D1 D2
Diode	1N4740A ZENER 10V 0.5W 5%	480162	D9

Miscellaneous

Device	Description	Part #	Designator
Panel Mic Jack	PHONE JACK	210050	
Pot	SHAFT FOR PIHER POT BLACK	240069	R5
Switch	DPDT TOGGLE, PC MNT W/BRACKET	510126	S1

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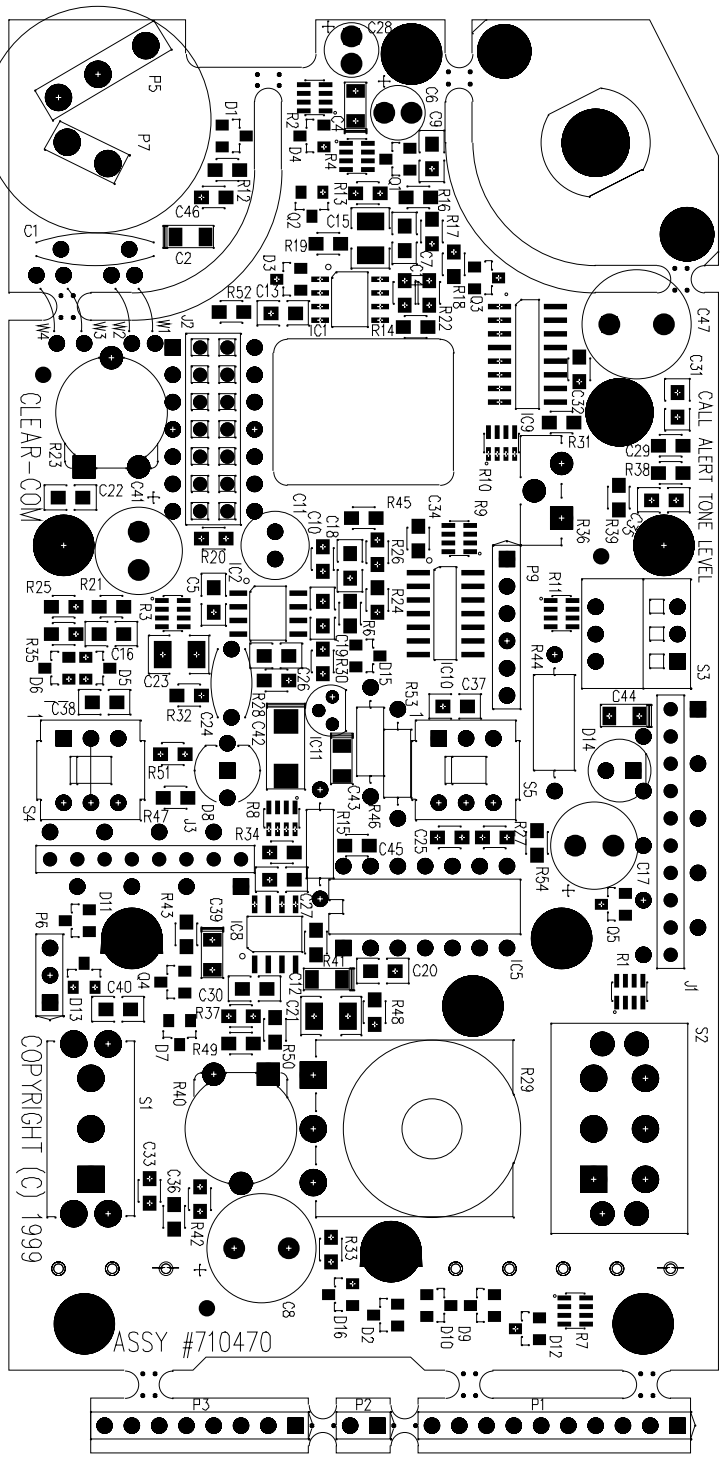

FIGURE 8: Main PCB Component Layout

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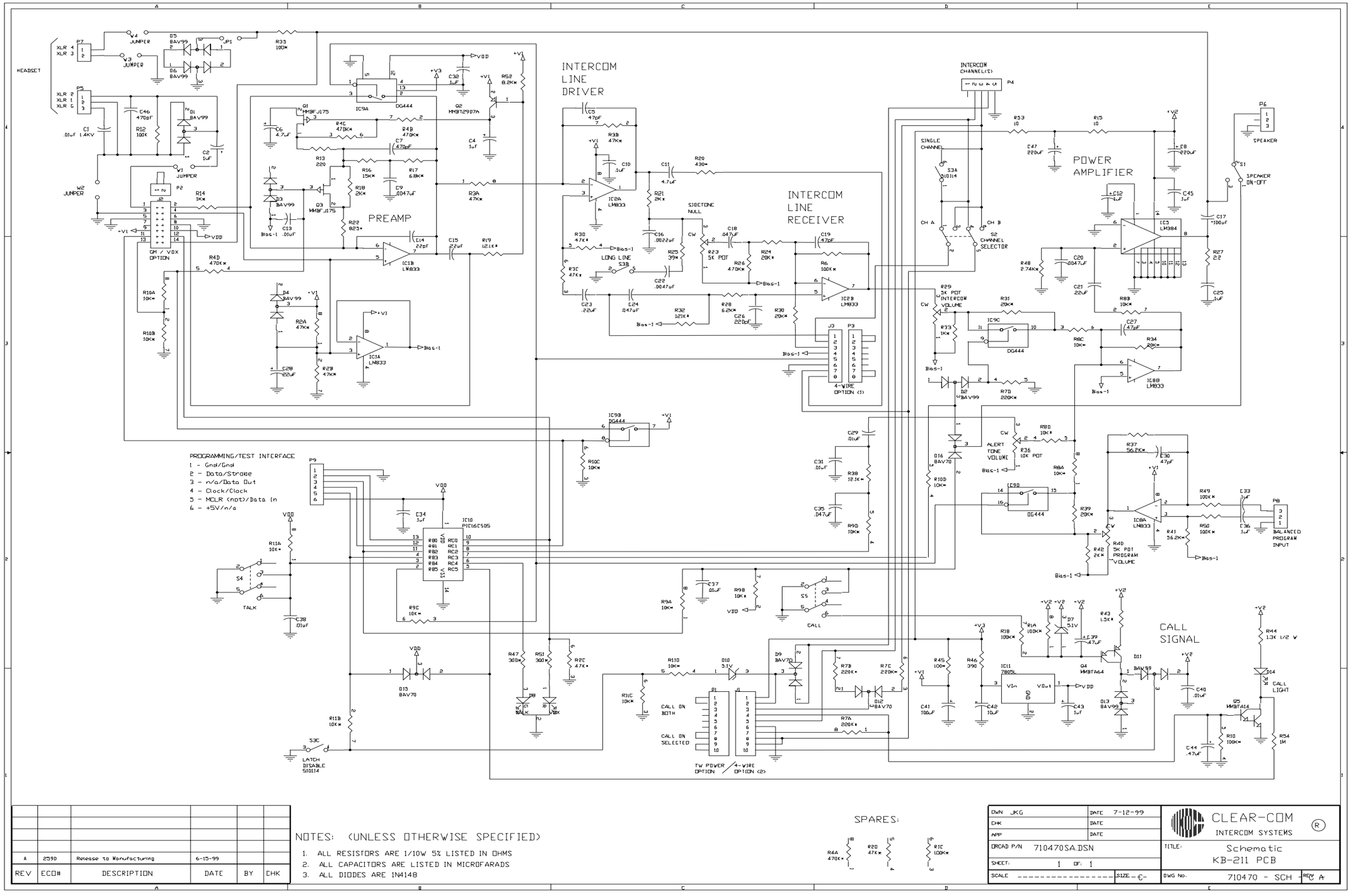

FIGURE 9: KB-211 Schematic

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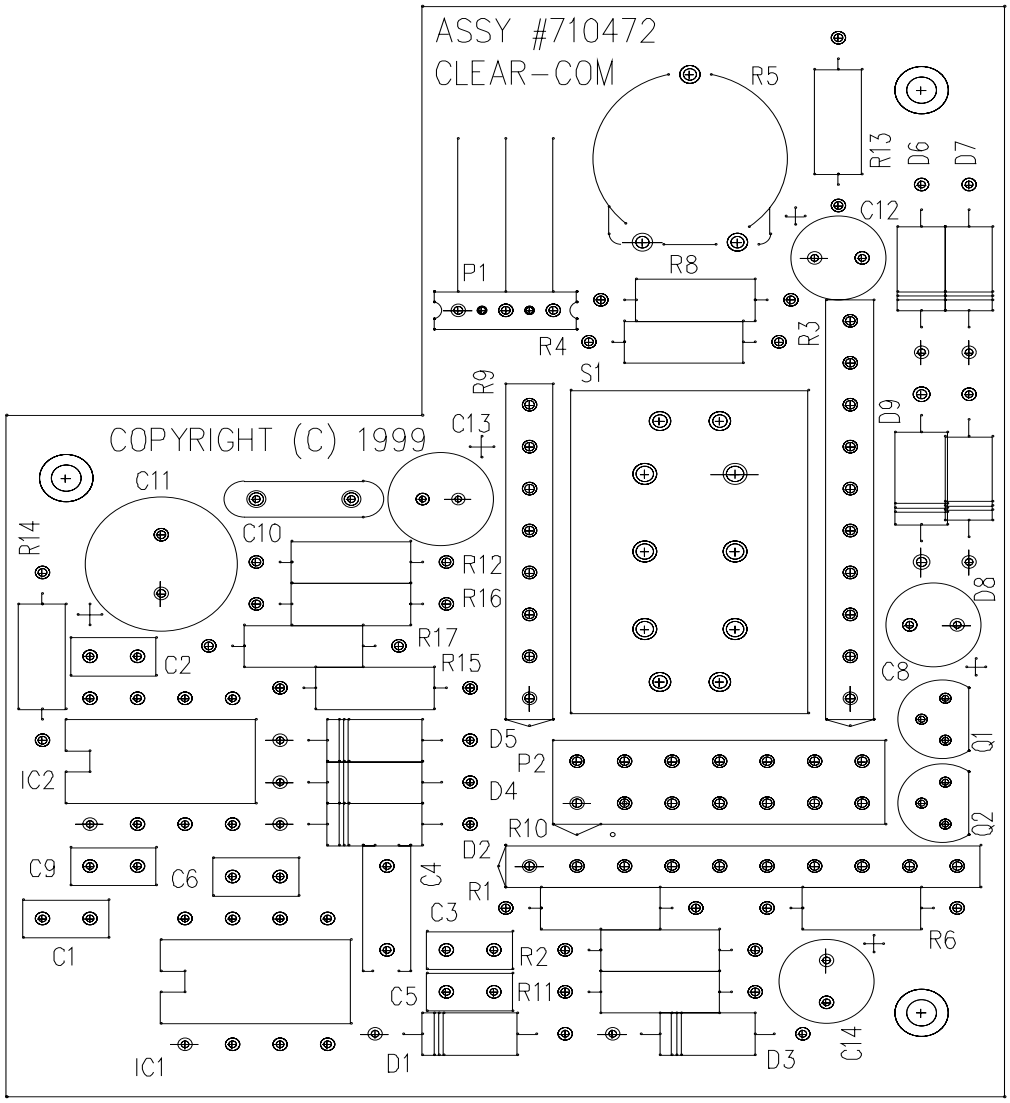

FIGURE 10: VOX PCB Component Layout

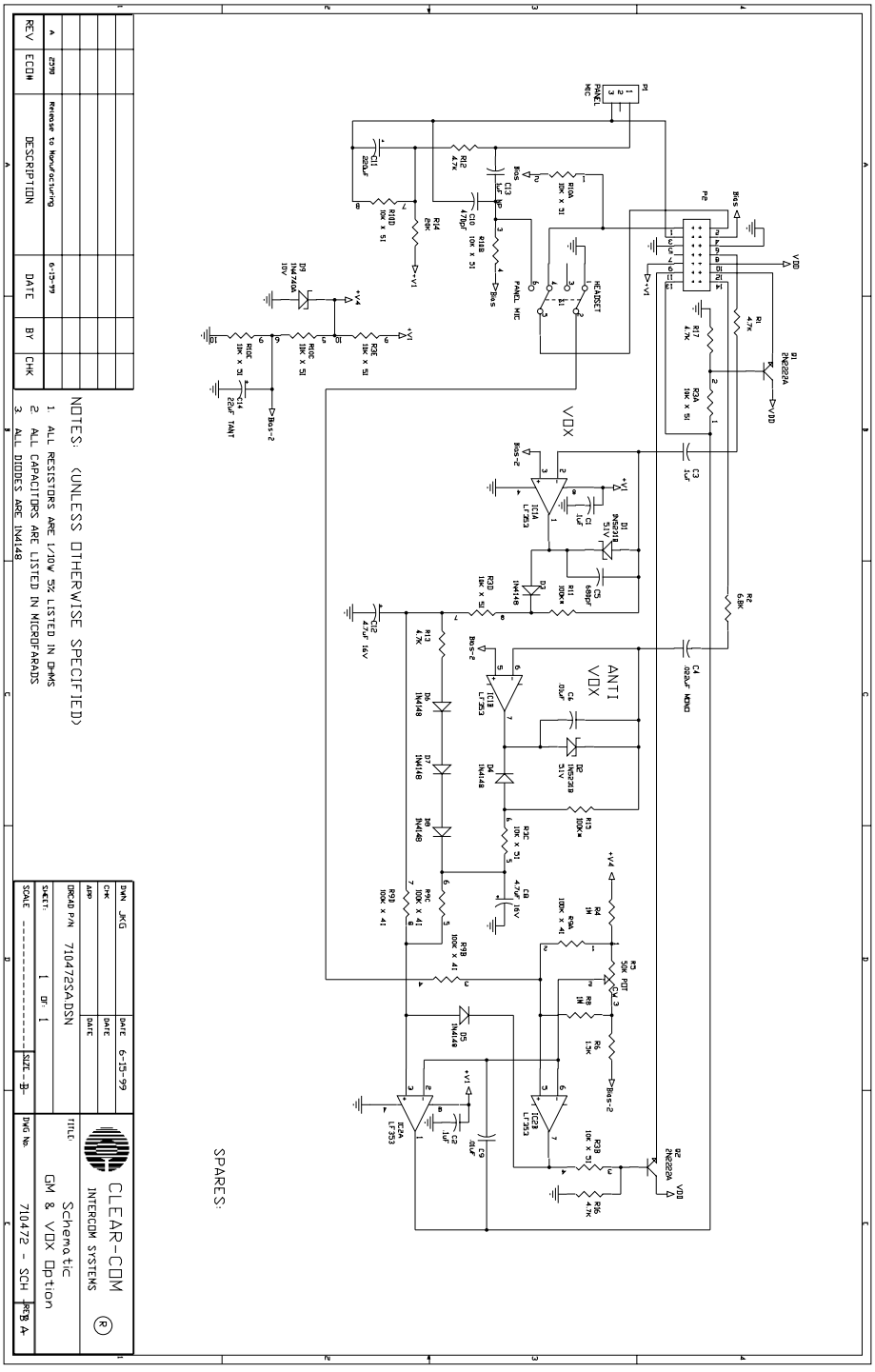

FIGURE 11: VOX Schematic

Technical Specifications

Headset Microphone Pre-Amp

Input Type:	Dynamic
Impedance:	1k ohm
Input Level:	-55 dBV nominal; -10 dBV max.
Gain from headset mic to intercom line:	+41 dB

Panel Microphone Pre-Amp (KB-211GM only)

Input Type:	Electret
Input Level:	-45 dBV nominal
Gain from panel mic to intercom line:	+31 dB VOX not tripped/+41 dB VOX tripped

Pre-Amp Response Curve

Frequency Response:	250 Hz to 12 kHz, contoured for intelligibility
Limiter Range	20 dB

Headphone Amplifier

Load Impedance Range:	50 ohm to 2k ohm
Output Level:	at least +20 dBV across 600 ohm
Distortion:	< 0.5% THD at 1 kHz
Frequency Response:	200 Hz to 15 kHz, ±3 dB
Gain from intercom line:	+37 dB
Power Output:	110 dB SPL

Speaker Amplifier

Speaker Type:	2.5 in. round, 16 ohm
Power Output:	2 W into 16 ohms
Frequency Response:	200 Hz to 15 kHz, ±3 dB
Signal-to-Noise:	75 dB
Gain from intercom line:	+37 dB
Distortion:	< 0.5% THD at 1 kHz
Speaker Level:	98 dB SPL at 3 ft.

Program Amplifier

(Transformerless, balanced differential input)

Input Level:	-20 dBV
Input Impedance:	> 100k ohm
Frequency Response:	150 Hz to 15 kHz, ± 3 dB

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Power Requirements

Voltage:	30-VDC standard unit; 16 to 18 VAC with 4-Wire Option Module
Current:	100 mA average

Internal Connectors

Intercom:	five-position, plug-on screw terminals
Program:	three-position, plug-on screw terminals
AC Power (4-Wire Option Module):	two-position, plug-on screw terminals

Internal Controls

(1) Call Signal jumper; (3) Option switches; (1) Tone Alert Volume control

Front Panel Connectors

Panel Mic:	(1) 1/4-in. panel mounting jack (KB-211GM only)
Headset:	(1) XLR-4M

Front Panel Controls & Indicators

(1) Panel/Headset Mic switch (KB-211GM only); (1) Program Level control; (1) Intercom volume control; (1) Sidetone control; (1) Talk button; (1) Call button; (1) VOX control (KB-211GM only); (1) Channel selector; (1) Speaker On-Off switch; (1) Talk LED; (1) Call LED

Environmental

32 to 122 F (0 to 50 C)

Dimensions

8.25 in. W x 4.5 in. H x 1.75 in. D (210 mm x 114 mm x 44 mm)

Weight

1.22 lbs. (0.56 kg)

Notice About Specifications

While Clear-Com makes every attempt to maintain the accuracy of the information contained in its product manuals, that information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

KB-211/KB-211GM Manual P/N 810253
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Clear-Com Limited Warranty

The Clear-Com warranty does not cover any defect, malfunction, or failure caused beyond the control of Clear-Com, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improper associated equipment, attempts at modification and repair not authorized by Clear-Com, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

This warranty is the sole and exclusive express warranty given with respect to Clear-Com products. It is the responsibility of the user to determine before purchase that this product is suitable for the user's intended purpose.

Any and all implied warranties, including the implied warranty of merchantability are limited to the duration of this express limited warranty. Neither Clear-Com nor the dealer who sells Clear-Com products is liable for incidental or consequential damages of any kind.

For your own records fill in the information below:

Model No _____ Serial No. _____

Date Purchased _____

Purchased from (dealer) _____

Address _____

City _____ State _____ ZIP _____

Factory Service

All equipment returned for repair must be accompanied by documentation stating the return address, telephone number, date of purchase, and a description of the problem.

Note: Do not return any equipment to the factory without first obtaining a Return Authorization Number.

Send equipment to be repaired to:

Customer Service Department
Clear-Com Intercom Systems
4065 Hollis Street
Emeryville, CA 94608-3505
Telephone: (510) 496-6666
Fax: (510) 496-6601

Warranty Repairs

If in warranty, no charge will be made for the repairs. Equipment being returned for warranty repair must be sent prepaid and will be returned prepaid.

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Non-Warranty Repair

Equipment that is not under warranty must be sent prepaid to Clear-Com. If requested, an estimate of repair costs will be issued prior to service. Once repair is approved and repair of equipment is completed, the equipment will be shipped freight collect from the factory.

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Manual Part Number 810253 Rev. A